## **CLAIMS**

## I claim:

5 A method of obtaining uniform coupling onto a microwave nonreciprocal resonator 1. showing a circular symmetry, comprising:

> A) installing an outer feeder network consisting of an N-fold binary divider showing a circular symmetry coincident with that of said microwave nonreciprocal resonator, where N is a non-negative integer,

B) if N > 0, installing electronic switches of a predetermined type or types at predetermined position or positions distributed with said outer feeder network so that 2<sup>N</sup> paths results,

C) installing an inner feeder network consisting of a radial branch rendering M branch arms of an equal electrical length and a common vertex coincident with the center of said microwave nonreciprocal resonator, where M is an integer no less than 1,

D) if M > 1, installing electronic switches of a predetermined type or types at predetermined position or positions distributed with said inner feeder network so that M paths results,

wherein by electrically coupling in/out said outer feeder network and said inner feeder network with said microwave nonreciprocal resonator, distinct electrical paths result, each of which is characterized by a unique phase with nominally the same insertion loss, thereby realizing said uniform coupling onto said microwave nonreciprocal resonator.

2. The method of Claim 1 wherein said microwave nonreciprocal resonator results from magnetic bias of a ferrite medium loaded with said microwave nonreciprocal resonator.

The method of Claim 1 wherein said microwave nonreciprocal resonator results

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from phase-quadrature feeding at orthogonal positions activated by said electronic switches distributed with said outer feeder network.

- 4. The method of Claim 1 wherein said radial branch shows a circular symmetry coincident with that of said microwave nonreciprocal resonator.
- 5. The method of Claim 1 wherein said distinct electrical paths include M · 2<sup>N</sup> paths.
- 6. A uniform coupling device to be installed with a nonreciprocal resonator showing a circular symmetry, comprising:
  - A) an outer feeder network consisting of an N-fold binary divider showing a circular symmetry coincident with that of said nonreciprocal resonator, where N is a non-negative integer,
  - B) an inner feeder network consisting of a radial branch rendering M branch arms of an equal electrical length and a common vertex coincident with the center of said nonreciprocal resonator, where M is an integer no less than 1,
  - C) electronic switches of a predetermined type or types at predetermined position or positions distributed with said outer feeder network, if N > 0, and said inner feeder network, if M > 1, to result  $2^N$  paths and M paths, respectively;

wherein by electrically coupling in/out said outer feeder network and said inner feeder network with said nonreciprocal resonator, distinct overall electrical paths result, each of which is characterized by a unique phase with nominally the same insertion loss, thereby realizing the desired uniform coupling operation of said uniform coupling device.

7. The uniform coupling device of Claim 6 wherein said nonreciprocal resonator results from magnetic bias of a ferrite medium loaded with said microwave nonreciprocal resonator.

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8. The uniform coupling device of Claim 6 wherein said nonreciprocal resonator results from phase-quadrature feeding at orthogonal positions activated by said electronic switches distributed with said outer feeder network.

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- 9. The uniform coupling device of Claim 6 wherein said radial branch shows a circular symmetry coincident with that of said nonreciprocal resonator.
- The uniform coupling device of Claim 6 wherein said distinct electrical paths include M · 2<sup>N</sup> paths.

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11. The uniform coupling device of Claim 6 wherein said nonreciprocal resonator shows the shape of a disk or a ring assuming the microstrip, stripline, or the other planar circuit geometries.

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12. The uniform coupling device of Claim 6 wherein said inner feeder network assumes the microstrip, stripline, or the other planar circuit geometries, placed inside said nonreciprocal resonator showing the ring shape, or below/above said nonreciprocal resonator showing the disk shape.

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13. The uniform coupling device of Claim 6 wherein said outer feeder network assumes the microstrip, stripline, or the other planar circuit geometries, placed outside said nonreciprocal resonator showing the ring shape or the disk shape.

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- 14. The uniform coupling device of Claim 6 wherein electrically coupling in/out said outer feeder network and said inner feeder network with said nonreciprocal resonator means capacitive coupling, inductive coupling, and./or conductive coupling.
- 15. The uniform coupling device of Claim 6 wherein said electronic switches incorporate semiconductor diodes, transistors, ferrites, ferroelectrics, and/or

superconductors, activated via the application of an electric current, a voltage, a light, a temperature change, and/or a magnetic/electric field.

- 16. The uniform coupling device of Claim 6 wherein said M branch arms do not necessarily to intersect all at one point; they may join each other first individually before leading to said common vertex.
- 17. The uniform coupling device of Claim 6 wherein impedance transformers, amplifiers, and/or attenuators are included with said outer feeder network and/or said inner feeder network.

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## SEQUENCE LISTING (Not Applicable)